

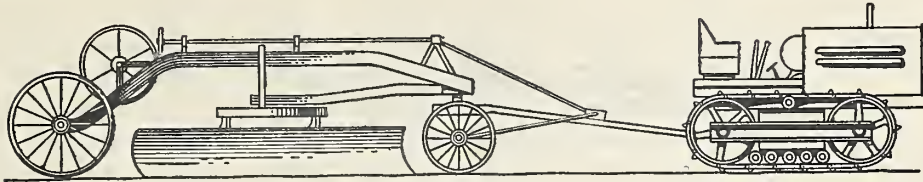
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CONSTRUCTION



HINTS

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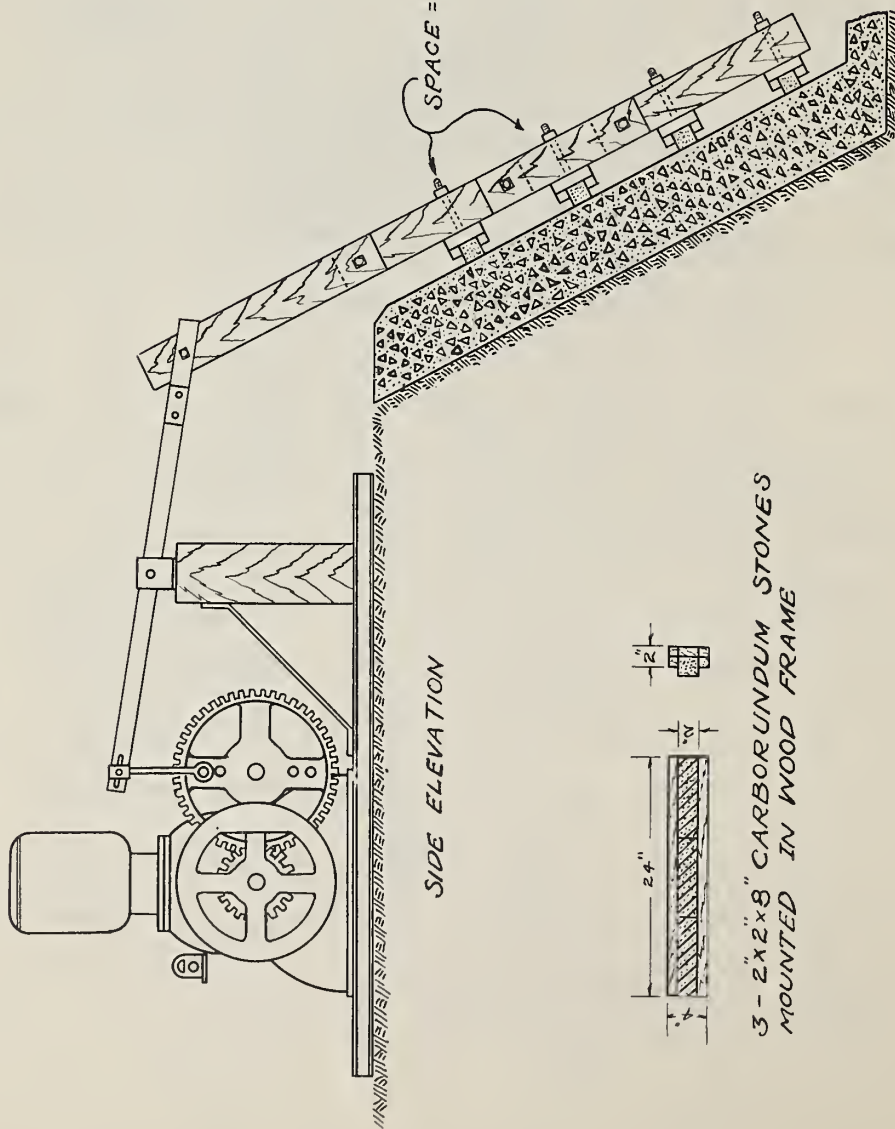
CONCRETE SURFACING MACHINE USED IN CONSTRUCTION OF HERRINGTON CREEK DAM, NEAR OAKLAND, MARYLAND

The motor and gear of a diaphragm pump were used as a power unit. The pump was removed and a longer walking beam installed. The length of the stroke was controlled by the location of the center bearing of the beam. All joints in the frame carrying carborundum stones were loose to insure even bearing of stones on wall. A little water was thrown on wall as needed. Two enrollees operated this machine and rubbed an area of wall, in a day, equivalent to an area rubbed by ten men by hand the day before. The machine was designed and built by Foreman G. W. Pritts, of Camp S-59, Oakland, Maryland.

(Over)

1 1/2 H.P. NOVO DIAPHRAGM PUMP
WITH PUMP REMOVED

STONE RACK ASSEMBLY



SIDE ELEVATION

FRONT ELEVATION

3 - 2 1/4" x 2" x 8" CARBORUNDUM STONES
MOUNTED IN WOOD FRAME

HERRINGTON CREEK LAKE
SWALLOW FALLS STATE FOREST
SWALLOW FALLS MARYLAND

IMPROVISED CONCRETE SURFACE FINISHER

DRAWN BY *W. H. Little* 10-21-37

ERECTION OF WOOD TOWERS

In the erection of prefabricated wood towers at State Camps P-87, Rome, Georgia, and P-71, at Springville, Louisiana, the method used was somewhat different from that used in the erection of regular steel towers.

After due consideration of several methods I finally decided to use four gin poles instead of the usual one. The use of four was decided upon because of the fact that after a few sections of columns were set the lengths of the column sections vary, the sets diagonally opposite each other being the same length, one set being only one panel high and the other set two panels high. Some of the column sections are 26' long and are hard to handle, especially if there is any wind. All the columns are 8" x 8"s, varying in length from 12' to 26'. The gin poles used at P-87 were ordinary 20' telephone poles, while those used in Louisiana were 25' green pine poles.

A piece of 2" x 8", 30" long, was spiked to each one of these poles at the bottom so that they could be fitted to the columns. The upper ends of the poles were fitted with a strap 1/2" thick by 2" wide, with an eye on the overhanging end to receive the hook of a single block. To fasten the gin poles to the column 4 straps 3/4" x 2" x 12" were provided. These straps fitted across the inside face of the tower column and the outside face of the gin pole with 3/4" x 16" bolts connecting and tightening the straps. No guy lines were used on the gin poles, the above fastening being sufficient to stand any pull necessary to raise any of the members of the tower.

Two stages, on opposite sides of the tower, were used, these being built of two 2" x 12"s, 14' in length and held in a frame at each end. The frame was made of 3/4" rod, threaded at each end, the inside, or side next to the tower, having the same batter (3/4" to the foot) as the tower leg. At the top of this rod frame an eye was provided, a piece of manila line 10' in length securely fastened to the eye to tie the staging to the column.

Eight single steel blocks (3/4" x 4"), one double block of the same size, and one snatch block were provided. Twelve hundred feet of 5/8" manila rope and six hundred feet of 1/2" manila rope were used.

Four rings 16" in diameter, made of 1/2" rod and open on one side with 6" extensions on the open side flattened and bored for a 1/2" bolt provided a means of fastening them to the tenon of the column. These rings were used in "jumping" or hoisting the gin poles to new positions when a panel was finished.

Holes were drilled in the bottom end of the gin poles and a wire loop run through the hole to provide a means of attaching a line to the pole to hoist it.

The first panel was set with one gin pole, the diagonal braces being fastened to the upper end of the columns before they were raised from the ground. After the four columns were hoisted to position the horizontal struts and the remaining diagonal braces were bolted into place. Before these columns were hoisted to position the 16" rings mentioned above were bolted to the tenons to act as a guide for the gin poles.

The gin poles were placed in the following manner: A sling and single block were placed on each column at the shoulder formed by the tenon, a single line fastened to the lower end of the gin pole running through the block and through a snatch block fastened to the bottom struts of the bottom panel. A pull on this line raises the gin pole parallel to the column and into place just below the top set of struts and diagonal braces already bolted to the columns. A tail line was used on the bottom of the gin pole to keep it from tipping over when it reaches its maximum height above the 16" ring on the column. The line supporting the gin pole is then tied off and the above mentioned clamps put around the column and gin pole.

As the upper end of the gin pole comes through the ring a man hooks a single block in the strap at the upper end of the gin pole. A line has already been threaded through the block and the block and line go up with the gin pole as the gin pole is hoisted. This procedure is followed on all four columns.

The batter of the gin pole is the same as that of the column, consequently the upper end of the gin pole is vertically inside the tower panel already in place. For this reason all tower members are hoisted inside the tower and the batter is enough so that the members being hoisted clear are not fouled in hoisting.

After the gin poles are hoisted into place and clamped, the 16" ring is taken off the column and gin pole and lowered to the ground and put on the upper end of the next section to be hoisted. This prevents having to climb the column to put the ring in place after the section of column is up. Also, all split rings are placed on the column section before hoisting.

Two diagonal braces, one for the "A" face and one for the "B" face, are hoisted with the gin pole and laid on the horizontal struts ready to be fastened to the section of column when it comes up.

Scabs for connecting column members at splices are hoisted into place and loosely bolted at the bottom to the column section already in place. Split rings and bolts are put in the scabs before they leave the ground.

When the column section is ready to be hoisted, a line is fastened to the column just below the upper rings, a clove hitch being used to prevent slipping. This line runs through the block on the gin pole and through a snatch block at the bottom of the tower. A pull on the line raises the column section until the section reaches a height where two diagonal braces can be bolted to the section. After the braces have been bolted to the section the column is hoisted high enough so that the bottom tenon will slip in between the scabs.

One man is provided at each corner of the tower. The lower ends of the two diagonals fastened to the section of column being hoisted are handled and bolted in place by the men on the two adjacent corners, while one man guides the column into place between the scabs. As soon as the column is in place the hoisting line is tied off and kept tied until the column section is securely bolted in place. This procedure is followed on each corner of the tower.

After the column section is bolted into place the hoisting line is removed from the column. The point at which the hoisting line has been fastened to the column is too high to be reached. A small section of 1" pipe, 10' long, with a hook in the end of it is used to loosen the line and slip it down the column to a point where the operator can untie it. All short sections of columns are handled in this manner. When the panels are reached where the column legs are staggered, that is, where two short sections and two long sections are used, in addition to the above three guy lines are fastened to the top of the long column sections to prevent tipping. These are absolutely necessary and are handled by three men on the ground who pay the lines out uniformly as the section is hoisted.

The two stages are hoisted into place by the same lines used to hoist the column sections and other material. These two stages are on sides of the tower directly opposite each other and when hoisted slide up the sides of the columns adjacent to the sides where the gin poles are clamped. This placing of the stages and the gin poles prevents any interference from the gin poles or stages when either one is being moved. After the stages are pulled up into place they are tied off to the column just below the panel point, care being taken to hoist them high enough so that men standing on them can reach all the connections to be made at that point. A tight line running between the eyes of the rod frames at the ends of the staging prevent the frames pulling apart at the top and also furnish a means of fastening safety belts of the operators. The safety straps of the belts are hooked around this line and the operator can walk from one end of the stage to the other without unhooking the safety strap. This provides safety for the operator at all times with a minimum of trouble in hooking and unhooking his safety strap. All operators up on the tower are provided with wrenches and hammers.

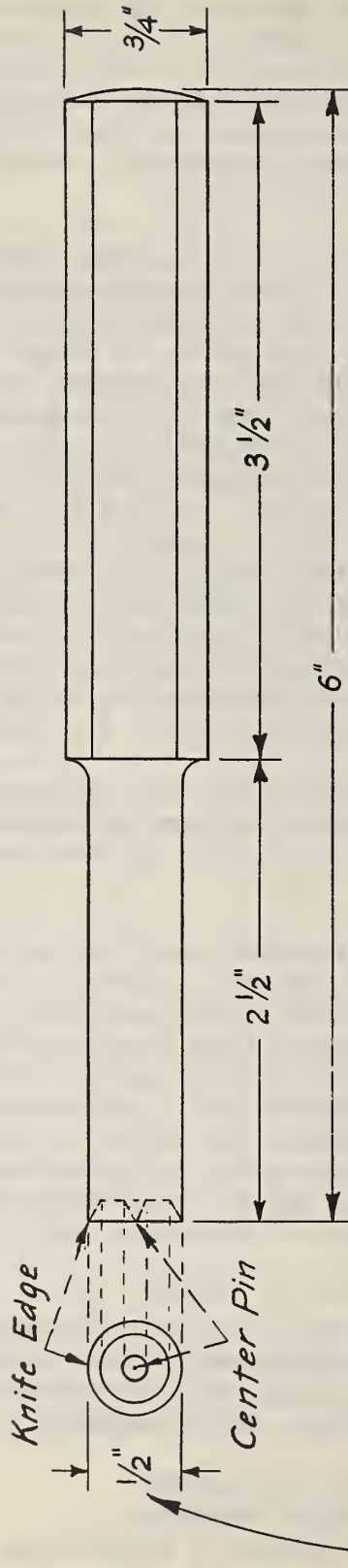
In addition to the four men on the tower, ten men are needed on the ground. In hoisting the longest section of columns it is necessary to use a double block on the hoisting line to provide safe uniform movement of the section as it is going up.

I found that it expedited matters when one of the ground men was put in charge of rings and bolts, three designated on guy lines and the rest of the men told off to handle hoisting lines. It is necessary that men tying off the stages and lines to the column sections know how to tie the proper kind of knots; otherwise, accidents may happen or knots be pulled so tight it is impossible to loosen them. With inexperienced men it is necessary that one man direct all operations to prevent accidents. It is also advisable to provide all wrenches and hammers used by the operators up on the tower with about 3' of 1/8" cord fastened to their belts and to the hammers and wrenches to prevent falling. This is quite a source of danger and should be watched carefully.

During construction it is important that towers be braced after work each day to prevent blowing over. The permanent cables cannot be attached until the tower reaches a height of at least 74'. The footings are insufficient to prevent overturning if high winds should suddenly arise.

H. W. RAINEY,
Chief Inspector.
Division of Engineering, R-8
August 20, 1937.

*Tool for Marking Bolt Holes in Truss Construction
where Split Rings are used*



*Where Tight Fit Bolts
are used-machine
1/16" under Size*

3/4" Drill Steel

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
ANGELES NATIONAL FOREST
CALIFORNIA

BOLT HOLE MARKING TOOL

By: C.F. Thyberg Approved: *NOVEMBER 1937*

*Note: All bolt holes where split rings
are used must be laid off from a cen-
ter line and not from the edge of the
timber. A template must be employed.*